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Perinatal depression screening : using antenatal depression screens and patient demographics to predict risk for postpartum depression :

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Perinatal Depression Screening:
Using Antenatal Depression Screens
And Demographic Factors
To Predict Postpartum Depression

ABSTRACT

This study examined the relationship between antenatal depression and postpartum depression in pregnant women at a family health clinic. The aim was to determine whether antenatal depression screens predicted postpartum depression. The Edinburgh Postnatal Depression Screen (EPDS) was used to screen for depression in 411 pregnant women during the first trimester, third trimester and postpartum phases of pregnancy. Risk factors including patient body mass index, socioeconomic status and marital status were considered predictors of perinatal depression. EPDS scores were analyzed over the three time periods and were compared to body mass index, socioeconomic status and marital status. Results indicated that third trimester EPDS scores predicted postpartum EPDS scores. Body mass index was positively correlated with postpartum EPDS scores. Socioeconomic status negatively correlated with first trimester EPDS scores. Single patients endorsed higher rates of depressive symptoms than married patients during the first trimester of pregnancy. Implications for clinical practice are discussed.

PERINATAL DEPRESSION SCREENING: USING ANTENATAL DEPRESSION SCREENS AND PATIENT DEMOGRAPHICS TO PREDICT RISK FOR POSTPARTUM DEPRESSION

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CHAPTER I

Introduction

The purpose of this study was to examine the relationship between prenatal depression and postpartum depression (PPD) in pregnant women at a family health clinic. Specifically, this study aimed to determine if antenatal depression could be identified as an independent predictor of postpartum depression. Additionally, this study sought to identify any risk factors associated with PPD such as body mass index (BMI), socioeconomic status (SES) and marital status. The eventual goal was to inform practitioners in family health clinics to universally screen for depression and ultimately provide interventions for women identified as being at risk for PPD.

Depression is the leading cause of disease burden for women in high-income, low-and middle-income countries worldwide (World Health Organization, 2013). The DSM-5 defines major depression as presenting with five (or more) of the following symptoms: depressed mood most of the day, nearly every day, markedly diminished interest in most activities, significant weight loss or weight gain, insomnia or hypersomnia, psychomotor agitation, fatigue or loss of energy, feelings of worthlessness, diminished ability to concentrate, and recurrent thoughts of death or suicidal ideation. These symptoms should also be evaluated as causing clinically significant impairment in social, occupational or other important areas of functioning and persist for at least two weeks. (American Psychiatric Association, 2013). Minor depression is often used to describe depressive conditions that are not of sufficient severity and duration to be categorized as a major depressive episode (Rapaport, Judd, Schettler, Yonkers, Thase, Kupfer, & Rush,

2002). Perinatal depression encompasses major and minor depressive symptomatology occurring during pregnancy and within the first 12 months following delivery (Gaynes, Gavin, Meltzer-Brody, Lohr, Swinson, Gartlehner & Miller, 2005). Antenatal and prenatal depression refers to depression during the pregnancy, before delivery. Postpartum depression refers to depression six to twelve weeks following delivery. In this report I will refer to major depression, minor depression, perinatal depression, postpartum depression, antenatal depression, prenatal depression and using the general term "depression."

In recent studies, considerable attention has focused on postpartum depression, which is considered the number one leading complication of childbirth today (Gaynes et al., 2005). For many women, the perinatal period is a time of increased vulnerability to mental health issues, particularly depression and anxiety. Women with no history of mental health disorders often experience their first mood or anxiety disorder during pregnancy (Goodman & Tyler-Viola, 2010). It has been estimated that PPD affects 500,000 women in the United States per year, accounting for 13% of postpartum women (Goodman & Tyler-Viola, 2010; Wisner, Parry & Piontek, 2002). The World Health Organization (2013) estimated that depression following childbirth affects 20% of mothers in low and lower-middle-income countries. Others have estimated that PPD can affect as high as 38% of women among lower socioeconomic status (SES) first-time mothers (Goodman & Tyler-Viola, 2010).

Furthermore, it has been suggested that about half of all postpartum depression actually begins during pregnancy – antenatal depression (Evans, 2001). According to some estimates, depression affects 7%-20% of women during pregnancy (Gaynes, et al., 2005; Le Strat, Dubertret & Le Foll, 2011). Other estimates range from 12-37% (Leigh & Milgrom, 2008,) with rates as high as 35%-40% for low-income, culturally diverse women (Higgins, Chao, Donatoni,

Lau & Harding, 2005). With the considerable amount of research suggesting depression can be identified at numerous different times during the pregnancy, this study sought to identify a connection between antenatal depression and PPD.

When discussing PPD, it is important to acknowledge the extensiveness of its effects. While mothers are the symptom bearers of PPD, symptoms affect the entire family, particularly the newborn child. As a result of PPD, interaction disturbances between depressed mothers and their infants appear to be universal across cultures and socioeconomic statuses (Field, 2010). These interaction disturbances often include decreased sensitivity and responsiveness to the infant, as well as compromised safety, sleep routines, breastfeeding and well-child visits (Field, 2010). The American College of Obstetricians and Gynecologists (ACOG) recognizes the importance of screening for, diagnosing and treating depression and its potential to benefit a woman and her family (ACOG, 2010). Perinatal depression is an early risk to the infant, to the mother-infant bond, and to the family unit (American Association of Pediatrics, 2010). Infants of depressed mothers display delayed psychological, cognitive, neurologic, and motor development (Gjerdingen & Yawn, 2007). Furthermore, children's mental and behavioral disorders improve when maternal depression is in remission (Weissman, Pilowsky, Wickramaratne, Talati, Wisniewski, Fava & Team, 2006).

Not only does PPD affect the child in the postpartum phase, but studies have shown antenatal depression negatively impacts the developmental health of the baby (Brittain, Myer, Koen, Koopowitz, Donald, Barnett & Stein, 2015). Studies indicate that maternal mental health during pregnancy may impact infant growth. Strong associations have been observed between antenatal depression and infant health complications including decreased infant weight and decreased head circumference (Brittain et al., 2015).

Contributing to the incidence of PPD are numerous personal and environmental risk factors that have been discussed as they relate to PPD. In this study I will examine pre-pregnancy body mass index (BMI), socioeconomic status (SES) and marital status. Previous research has identified the relationship between higher BMI and higher depression rates, but few have looked specifically at the relationship between BMI and perinatal depression. Additionally, numerous studies support a relationship between low SES and depression rates, but few examine low SES as it relates to pregnancy. Further, few existing studies have examined the mother's relationship with the father of the baby (FOB) and its impact on maternal depression (Akincigil, Munch & Niemczyk, 2010).

Though previous studies address the need for more attention to PPD, few incorporate social factors such as BMI, SES and marital status. By simply focusing on the link between antenatal depression symptoms and PPD, the literature neglects critical analyses of the patient population's social determinants of health and risk factors influencing these depressive symptoms. Accordingly, this study will make a distinct effort to situate the results amongst influential social factors as well as the ways in which these factors might intersect to influence risk for perinatal depression.

CHAPTER II

Literature Review

This chapter provides an overview of the existing literature relevant to this study. It begins with an overview of postpartum depression, risk factors associated with depression, theories of intersectionality and the biopsychosocial medical model, and a discussion of when and why to screen for depression during pregnancy.

Overview of Postpartum Depression

Recent research suggests that as many as 18.4% of all pregnant women are depressed during their pregnancy, with as many as 12.7% having a major depressive episode (Gaynes, et al., 2005). This distinction points to a continuum of depressive symptoms and levels of severity linked to diagnostic criteria put forth in Psychiatry's Diagnostic and Statistical Manual of Mental Disorders (DSM-5). Considerable discussion has surrounded the reported incidence of antenatal depression with respect to its difficulty to diagnose. Depression has long been regarded as underdiagnosed and overlooked in pregnant women (Geier, Hills, Gonzales, Tum, & Finley 2014) likely due to the medical field's focus on physical health and pregnancy-related complications.

When comparing non-pregnant women with perinatal women of the same ages (18 to 39 years), Geier et al. (2014) found that the perinatal group was significantly less likely to be diagnosed with depression. Even when pregnant women were diagnosed with depression, it was

found that fewer than half received any treatment, versus 72% receiving treatment in the non-pregnant control group. Women experiencing postpartum depression were similarly undertreated as well.

One possible explanation for this discrepancy in treatment was found in a research study which concluded that 37% of mothers diagnosed with PPD declined intervention and treatment when it was offered (Reay, Matthey, Ellwood & Scott, 2011). It is also likely that the overwhelming nature of caring for a newborn child leads to a decrease in maternal resources to engage in self-care. The new child rearing responsibilities, coupled with the lack of motivation and isolation associated with depression make it exceptionally difficult for depressed mothers to seek help.

Additionally, these impediments to treatment associated with PPD lead to a higher likelihood in maintaining and worsening depression. Reay et al. (2011) found that mothers who screened positive for postpartum depression were still significantly more depressed than their non-depressed counterparts even two years after pregnancy. These elevated depression symptoms were associated with poorer partner relationships and poorer mother-infant bonding.

Another explanation for the under diagnosis of perinatal depression is that medical practice has proven to be inadequate at identifying depression in pregnant women. A study by Goodman & Tyler-Viola (2011) examined both the patient's depression as well as the providers' ability to detect and make appropriate referrals for perinatal depression. Researchers screened patients for antenatal and postpartum depression using the Edinburgh Postnatal Depression Scale (EPDS) during pregnancy and two months postnatal. The researchers also viewed each patient's medical records for documentation of any psychiatric, mental health symptoms or treatment referrals made by medical providers. Providers were blind to the screening results of the study.

Results indicated that providers failed to identify the majority of women who screened positive for depression during and after pregnancy. Further, only 15% of patients who screened positive for depression received any mental health treatment during pregnancy. In the postpartum group, only 2.5% of patients who screened positive for PPD received referrals to mental health or social services (Goodman & Tyler-Viola, 2011).

The results of the 2011 Goodman and Tyler-Viola study provide insight to the current state of mental health screening and evaluation of pregnant women in many obstetric clinics. Contenders of depression screening during pregnancy argue that these screens will result in too many false-positives, which would serve to stigmatize women and create a sense of fear around depression and parental inadequacy (Lancet, 2016). Lancet (2016) argues that screenings will be inadequately implemented leading to inaccuracy in assessment and ultimately dedication of time and resources to women who are not actually depressed.

Based on the results found in the Goodman and Tyler-Viola study, the argument that screens will be incorrectly administered seems to hold weight. However, looking closer at the results, the screens done by Goodman & Tyler-Viola (2011) indicated that approximately half of women who screened positive for postpartum depression also screened positive prenatally. Therefore, these results indicate that systematic screening is not faulty, but the current methods, or absence of methods, used in these clinics, are. Essentially, the patient self-reported assessment screens provided in the study were more accurate at identifying depression than common practice done by nurses, doctors and social workers. Goodman & Tyler Viola (2011) added that these self-reported screens, though already accurate, would have been highly improved with a brief diagnostic interview carried out by a medical professional.

Risk Factors

Another way to improve the accuracy of perinatal depression identification would be to examine EPDS screen results alongside scientifically substantiated risk factors. There are numerous documented risk factors for depression during pregnancy. These include domestic violence, poor or low social support, an unplanned pregnancy, being a single or adolescent (Higgins, et al., 2005). A family history of depression, alcohol abuse and a personal history of depression also increase risk of perinatal depression (American Academy of Pediatrics, 2010).

Three of the most objective and easily identifiable risk factors are body mass index, socioeconomic status and marital status. Body mass index data, often taken at intervals throughout the pregnancy, can be calculated from the patient's health chart. Marital status is often taken during the intake appointment. Socioeconomic status, though often undocumented in health clinics, can often be deduced based on the patient's health insurance provider. For example, patients on Medicaid represent an unemployed or underemployed population while patients on private health insurance often represent an employed population. Each of these risk factors is easily accessible to the health professional. Other common risk factors such as domestic violence, unplanned pregnancies, or low social support are not as readily available to health providers and are less likely to be reported by the patient.

Body Mass Index

Excess weight is regarded as an epidemic in the United States, with 69.2% of the population overweight or obese (Ogden, Carroll, Kit, & Flegal, 2014). Obesity alone is considered a risk factor for depression in all women (Onyike, 2003). Nearly half of women of childbearing age in the U.S. are either overweight or obese (Reece, 2008).

Numerous studies indicate that there is an interaction between obesity and depression (Noppa & Hallstrom, 1981; Thompson, Coovert, Richards, Johnson, & Cattarin, 1995). In many cases, depression leads to obesity, and in other cases, obesity leads to depression. Noppa & Hallstrom (1981) examined middle-aged women over a six-year period, finding a positive association between depression at baseline and subsequent weight gain. Even further, the researchers found that there was a positive relationship between severity of depression and weight gain. Women with severe depression on average experienced significantly higher weight gain than women with moderate or no depression.

Another interaction between obesity and depression can be a result of societal perceptions of beauty. Thompson et al., (1995) conducted a 3-year prospective study of adolescents demonstrating the impact of obesity on depression. The researchers examined the social implications of obesity finding that the measured factor of "teasing" mediated the relationship between obesity and subsequent depression (Thompson et al., 1995). In other words, the obesity status of these young women resulted in teasing which lead to increased dissatisfaction with their body image, ultimately resulting in greater levels of depression.

Though teasing may not be as prevalent in young adulthood and adulthood, cultural expectations of appearance are still communicated through the media. Current societal pressure in the United States stresses the importance of being thin. Consequently, overweight women are likely to experience higher levels of body dissatisfaction, increasing their risk of depression (Clark, Skouteris, Wertheim, Paxton & Milgrom, 2009).

Other studies have found the opposite effect. Roberts, Strawbridge, Deleger and Kaplan (2002) examined 6,928 participants over a six-year period, finding that participants at a baseline of obesity were at elevated risk for subsequent depression and other mental health difficulties

(anxiety, phobias etc.). Using the same data a year later, Roberts, Deleger, Strawbridge & Kaplan (2003) sought to identify a reciprocal relationship between depression and obesity as well as other presumed risk factors such as marital status, socioeconomic status, and social support. The researchers posed the questions of: Does obesity increase risk for depression? Does depression increase risk for obesity? Is there a reciprocal risk between depression and obesity? And is there no association between depression and obesity? The results of the study only confirmed question one – obesity increases risk of depression. Additionally, the researchers found other significant social predictors of depression, including lower than high school education and financial strain (Roberts et al., 2003), factors closely associated with socioeconomic status.

Despite the strong relationship between obesity and depression, few studies have found an impact of pre-pregnancy weight on depression. Ertel, Dole, Markenson & Chasan-Taber (2015) assessed the impact of BMI, gestational weight gain (GWG) and elevated depressive symptoms across pregnancy among 1,090 Latino women in the United States. The researchers hypothesized that higher levels of BMI would correlate with higher levels of perinatal depression. However, the results of the study indicated no statistically significant associations between these factors. Additionally, they did not find any relationship between GWG and depressive symptoms. However, a chief limitation to the study was that weight was self-reported, decreasing the accuracy of BMI and GWG measurements. Further confounding the data is the impact of social factors. The researchers made no attempt to provide the depression screens in a culturally appropriate or sensitive manner other than providing the screens in the participants' desired language. Oftentimes patients were even sent home with the EPDS screen to return at a later date.

Other studies, however, have found such a connection between BMI and perinatal depression. Molyneaux, Poston, Khondoker & Howard (2016) examined data from 13,314 pregnant women finding that obese women had significantly higher rates of antenatal depression than normal weight controls, even after adjusting for socio-demographic factors. Specifically, women who were obese at the inception of their pregnancy were 40% more likely to develop antenatal depression than non-obese controls. Further, the researchers found that every unit increase in pre-pregnancy BMI was associated with approximately 3% higher likelihood of antenatal depression.

In a similar study, after controlling for maternal age, race/ethnicity, education, history of depression, pregnancy stressors, and history of abuse, LaCoursiere, Barrett-Connor, O'Hara, Hutton, & Varner (2010) found that pre-pregnancy obesity was an independent risk factor for postpartum depression. Women with BMI scores ranging from pre-obese to obese reported significantly higher rates of PPD symptoms compared to their non-obese counterparts (LaCoursiere et al., 2010). The results also indicated that obesity and depression in women were bidirectional – further supporting the evidence of an interaction between the two variables.

A similar relationship between BMI and perinatal EPDS scores was found in Salehi-Pourmehr, Mohammad-Alizadeh, Jafarilar-Agdam, Rafiee & Farshbaf-Khalili, (2017). Researchers screened normal weight control patients and obese patients at five points throughout the perinatal period - first trimester, second trimester, third trimester, six and eight weeks postpartum and twelve months postpartum. Results concluded that obese patients were significantly more likely to screen positive for depression than normal weight patients. In general, obese patients in the Salehi-Pourmehr et al., (2017) study were 3-4 times more likely to screen positive for depression than normal weight patients at each time frame. However, at the

six-week postpartum screen, obese patients were seven times more likely to screen positive for depression than normal weight patients.

More recently, attention has turned to anxiety during pregnancy as another risk factor. Firm estimates for prenatal anxiety do not exist (Dunkel-Schetter & Tanner, 2012). According to Dunkel-Schetter and Tanner (2012), "pregnancy anxiety appears to be a distinct and definable syndrome reflecting fears about the health and wellbeing of one's baby, of hospital and health-care experiences (including one's own health and survival in pregnancy), of impending childbirth and its aftermath, and of parenting or the maternal role" (p. 143).

Few studies expand the scope of the effects of obesity and depression to include anxiety despite the EPDS including three questions designed to measure anxiety. The few studies that do, however, have found a strong correlation between obesity and antenatal/postnatal anxiety. Nagl, Linde, Stepan and Kersting (2015) conducted a systematic review of the literature finding only seven studies that examine the relationship between obesity and anxiety in pregnant women. Of the seven studies, five found a positive association between the obesity and perinatal anxiety.

Whether it is depression or anxiety, vast amounts of research have drawn connections between obesity and increased mental health vulnerability in both pregnant and non-pregnant women. The majority of studies conclude that obese pregnant women likely constitute a subgroup of pregnant women at particular risk for psychiatric vulnerability and in need of psychological support during and after their pregnancies (Nagl et al., 2015).

Socioeconomic Status

Another factor predisposing women to psychiatric vulnerability is low socioeconomic status. Those of lower socioeconomic status face a disproportionate share of the burden of

disease, which includes depression and obesity (Everson, Maty, Lynch & Kaplan, 2002). Researchers often control for SES rather than examine its effects on participants (Adler, Boyce, Chesney, Cohen, Folkman, Kahn & Syme, 1994). More current research suggests that low-SES environments are not only stressful but they reduce an individual's capacity to manage stress, which leads to increased vulnerability to negative emotions and cognitions (depression, anxiety) (Gallo & Matthews, 2003). Additionally, included in an individual's capacity to manage stress would likely include a person's willingness to seek support, either social or professional, ultimately exacerbating symptoms.

Commonly, low SES has been found to be associated with high psychiatric morbidity and poorer access to health care. Across countries, studies have found that low SES groups have higher prevalence of psychiatric morbidity, poor coping techniques, on-going stress exposure and face more difficult access to health care and support (Lorant, Deliege, Eaton, Robert, Philippot & Ansseau, 2003). These coupled factors of higher stress and poorer access to support interact to increase the likelihood of depression and other psychiatric issues. In fact, in a meta-analysis across 20 studies, when comparing the lowest SES with the highest, researchers found on average that the lowest socioeconomic class was 2.6 times more likely to experience psychiatric stress than the highest (Lorant et al., 2003). The authors, however, caution that "socioeconomic inequality in depression is heterogeneous and varies according to the way psychiatric disorder is measured, to the definition and measurement of SES, and to contextual features such as region and time" (p.98).

Other studies have drawn a connection between socioeconomic status and postpartum depression. Goyal, Gay & Lee (2011) found that low SES was associated with numerous other individual risk factors of depression. The researchers found that "low SES was associated with

increased depressive symptoms in late pregnancy and at 2 and 3 months, but not at 1 month postpartum" (p. 96). They concluded that low SES often included lower than a college education, being unmarried and being unemployed. In the sample of 198 women, those presenting with these risk factors were "eleven times more likely to have elevated postpartum depression rates than their counterparts; even while controlling for prenatal depressive symptoms" (Goyal et al., 2011, p. 96).

Another study examined SES as it influences antenatal depression, finding the opposite effect. Molyneaux, Pasupathy, Kenny, McCowan, North, Dekker & Howard (2016) found that antenatal depression was substantially higher among high SES women than low SES women. Interestingly, the researchers also found an interaction between BMI and SES. Among high SES women, the likelihood of antenatal depression was twice as high for obese women than normal weight women. In the low SES women, there was no effect of obesity on antenatal depression. Researchers hypothesized this absence of effect was due to the overwhelming influence of other risk factors associated with SES such as financial stress and deprivation (Molyneaux et al., 2016).

Some studies have even suggested that employment can be a protective factor to depressive symptoms during pregnancy. Miyake, Tanaka & Arakawa (2012) found that unemployed women were significantly more likely to experience perinatal depression than part-time and full-time employed women. The researchers even found level of employment to be inversely associated with depressive symptoms during pregnancy – as employment level went up from clerical work to professional work depressive symptoms went down (Miyake et al., 2012). Specifically, lower level of employment is associated with lower education; lower income and lack of partner have been found to be significant predictors of depression in pregnant women

(Gotlib, Whiffen, Mount, Milne & Cordy, 1989; Koleva, Stuart, O'Hara & Bowman-Reif, 2010; Leigh & Milgrom, 2008; Rich-Edwards, Klienman, Abrams, Harlow, McLaughlin, Joffee & Gilman, 2006).

Marital status

As previously mentioned, marital status has been shown to interact with BMI, SES and influence depression rates in both pregnant and non-pregnant women (Gotlib et al., 1989; Koleva et al., 2010; Leigh & Milgrom, 2008; Rich-Edwards et al., 2006). The presence of a partner, particularly a husband, throughout pregnancy is positively correlated with a mother's mental health (DeKlyen, Brooks-Gunn, McLanahan & Knab, 2006). Further, other studies have found marital status to be an accurate predictor of postpartum depression (Beck, 2001; Segre, O'Hara M, Arndt, & Stuart, 2007). While marriage may not always be an indicator of a healthy, supportive relationship, it is presumed that marriage more often than not symbolizes commitment to a partner and thus, more resources devoted to the mother and the child.

In addressing the discrepancy between supportive and unsupportive relationships, Akincigil et al., (2010) analyzed postpartum depression along the lines of "relationship quality" rather than "marital status." Relationship quality was broken down into three aspects: 1. Presence of domestic violence (DV), 2. Disagreement on choice to have a child, and 3. Emotional supportiveness of the Father of Baby (FOB). Researchers found participants experiencing DV and disagreement on decision to have child endorsed elevated rates of PPD. Emotional supportiveness of the FOB independently and significantly predicted postpartum depression, even after controlling for social support received from others. Participants who reported emotional support were significantly less likely to endorse symptoms of PPD than their counterparts.

Similar studies have identified similar trends. Urquia, O'Campo & Ray (2013) found that participants who were living with and married to a partner of five years or longer were nearly five times less likely to experience intimate partner violence than non-married participants. Further, for every year increase of marriage, intimate partner violence decreased. In the present study, marital status was broken down along the lines of single (no partner) or married.

Intersectionality and Biopsychosocial Factors

When discussing social factors of BMI, SES and marital status as they relate to depression rates, it is important to address these factors as a part of a greater system influencing individuals. When drawing a connection between low SES and depression, treatment should not merely consist of improving the SES of patients. Rather, individuals with low SES experiencing depression reflect issues of social inequity (e.g. poorer access to healthcare providers) not solely the influence of economic or educational factors (Liang, Gong, Wen, Guan, Li, Yin, & Wang, 2012). More socially inclined models of treatment would argue that treatment of an individual of low SES experiencing depression should focus on promoting social justice and empowerment of the individual. Essentially, it is not the SES of an individual that predisposes them to depression; rather it is the social inequity experienced creating greater levels of distress and oppression.

Though I have examined BMI, SES and marital status independently as they relate to depression and psychiatric vulnerabilities, it is also important to acknowledge that these factors often co-occur or compound to create a greater impact on the individual. In recent decades, the depth of understanding of health issues has increased largely due to the biopsychosocial medical model (Alonso, 2004). George Engel (1977) introduced the biopsychosocial model, proposing the idea that humans are complex systems whose functioning depends on the integration of biological, psychological and social factors. These factors are almost always both interrelated

and independent. Recent findings in neuroplasticity indicate that socio-environmental forces possess the potency to alter human well-being by impacting neurobiology through an increase in stress and cortisol levels (Garland & Howard, 2009). Social events have the ability to switch on or off neural pathways that lead to patterned cognitions and emotions. These events over time may predispose a person to depression or other mental health issues.

Closely related to the biopsychosocial model is the concept of Social Determinants of Health (SDH), which the World Health Organization defines as, "the fundamental structures of social hierarchy and the socially determined conditions these structures create in which people grow, live, work and age"(World Health Organization, 2008, p. 2). Essentially, SDH are responsible for the health inequities and the unjust or avoidable differences in health status across race and SES (Liang et al., 2012).

The SDH perspective is particularly important for addressing obesity. Obesity is caused by poor diet and lack of physical activity. However, SDH looks at "the causes of the causes." In the case of obesity, SDH would propose to examine not what directly causes obesity – diet and physical activity – but rather what causes poor diet and lack of physical activity. For example, it is well documented that socioeconomic resources influence dietary choices and opportunities for physical activity (Bennett, Wolin & Duncan, 2008). Individuals living in low-income neighborhoods, for instance, often live in food deserts – areas where access to healthy foods and produce is limited. As a result, fast food dietary options are both prevalent and convenient, becoming the primary food source. Numerous studies in the United States and other developed countries report this inverse effect of SES and obesity – those of higher SES experience lower levels of obesity, and vice versa (Bennett et al., 2008).

A SDH focus would argue that high SES does not lead to lower levels of obesity. Rather, high SES leads to opportunities to live in neighborhoods with access to grocery stores and the ability to purchase foods of higher nutritional value and integrity. Additionally, low SES individuals are more prone to environmental stressors, which can lead to comfort eating and depression (Bennett et al., 2008). As research has also shown, depression leads to decreased motivation and motor activity, which can ultimately lead to increased body weight. Through this very process, more attention has begun to focus on SDH and its impact on mental health.

Recent discussion of SDH posits that these social determinants not only impact physical health, but mental health as well (Liang et al., 2012). Risk factors for many common mental disorders are associated with social inequalities – the greater the inequality the greater the risk (Balfour, Bell & Marmot, 2014). Despite the theorized connection between SDH and mental health, there is limited research evidencing this connection. Liang et al. (2012) examined a population of 3,738, primarily consisting of women, along factors of economic status, social cohesion and negative life events – SDH – as these factors are related to depression. Economic status and social cohesion were inversely associated with depression, while negative life events were positively associated with depression.

The biopsychosocial and SDH perspectives provide a deeper insight to the social risk factors associated with depression; particularly in the ways societal forces influence risk. In this study BMI, SES and marital status – risk factors for depression – were examined due to ease of measurability. However, when discussing these risk factors, their roots in societal and political inequities should always be considered. Though BMI, SES and marital status may directly influence depression, social determinants influence BMI, SES, marital status and depression from various angles.

Why Screen for Depression

The ACOG guideline emphasizes that women with current depression or a history of major depression warrant particularly close monitoring and evaluation. Despite acknowledging that depression is very common during pregnancy and the postpartum period, the 2010 ACOG opinion states that there is insufficient evidence to support a firm recommendation for universal antepartum or postpartum screening.

However, pregnancy presents a unique opportunity to screen for mental health symptoms that might have otherwise gone undiagnosed due to frequent appointments and increased contact with health providers. Further, screening for depression in hospital settings has proven to be effective. The majority of patients with depression first present in a primary care setting such as a hospital. A large proportion of these patients go undiagnosed (Almeida, 1996). Furthermore, it is estimated that between 45% and 95% of depressive patients report somatic symptoms rather than mental health symptoms (Simon, von Korff, Piccinelli, Fullerton & Ormel, 1999). For common mental health diagnoses such as depression, mental health screens have proven to improve the adequacy of depression diagnosis and treatment in primary care settings (Berghofer, Roll, Bauer, Willich & Pfennig, 2014). In busy settings such as hospitals, where patients have limited access to mental health professionals, depression screens can be a useful alternative to timely and costly diagnoses. In many settings, these screens are used as a way to catch any "red flags" that might have otherwise gone unrecognized.

When specifically screening for perinatal depression, the Edinburgh Postnatal Depression Screen (EPDS) is the most widely accepted instrument with its use spanning numerous countries (Matthey, Fisher & Rowe, 2013; Bhusal, Bhandari, Chapagai & Gavidia, 2016). The EPDS' removal of physical symptoms of depression and its inclusion of measures for anxiety make it

more accurate at identifying depression in pregnant women than other general depression screens such as the Patient Health Questionaire-9 (PHQ-9).

When to Screen for Depression

The ACOG currently reports there is insufficient data to recommend when and how often screening should be done. However, the American Academy of Pediatrics (AAP) recommends universal screening in the early postpartum period and screening for parental depression at each well-child visit (AAP, 2010).

Using a retrospective cohort analysis of a large managed care organization, Dietz, et al., (2007) investigated women's (n = 4,398) depression statuses by retrieving codes for depression and medication prescriptions immediately before pregnancy and how it relates to the trajectory of depression during and after pregnancy. It was found that one in seven women were treated for depression between the year prior to pregnancy and the year after pregnancy. As a result, efforts to screen within this time span would increase detection of PPD.

Although a more structured approach to screening for postpartum depression has been recommended at the six-week postpartum visit (Blenning & Paladine, 2005), systematic screening is far from universal. It has been suggested by Apgar, Serlin & Kaufman (2005) that the traditional timing of the postpartum visit may be too late to help some women. Consequently, this study chose to screen for perinatal depression in the first trimester of pregnancy, the third trimester and during the postpartum period - six weeks after delivery.

Summary

The intention of this research was to examine sociocultural risk factors in addition to antenatal depression scores in order to identify the most at risk populations for developing PPD.

The biopsychosocial medical model, social determinants of health theories and intersectionality theory were central to framing the scope of this study. This study was designed to identify specific patient characteristics that compose the highest-risk populations in order to improve clinical practice around PPD identification and treatment in family health clinics.

Though previous literature has examined the importance of screening for depression in pregnant women, few have introduced other risk factors into their examination. Additionally, though previous research has examined the effects of BMI, SES and marital status on depression, few to my knowledge have used these factors as possible predictors for PPD. By combining each of these risk factors for developing PPD, I hope to create a method for early and accurate identification of perinatal depression based on numerous sources of risk.

This research will contribute to social work by acknowledging the way SDH and other risk factors intersect to increase patient vulnerability. Furthermore, this study will hope to push back previous research by conducting multiple screens in the antenatal period to determine the most accurate time to screen for PPD. Though specific interventions will not be studied, recommendations for identification of patients with perinatal depression will be detailed. Ultimately, I will argue that the responsibility for screening for PPD in pregnant women should fall on social workers, which may result in the need for integration of the profession into family health clinics.

With respect to the previous research detailed on depression, perinatal depression, mental health screens, BMI and SES, I posed the following research questions:

- Can screening for depression during pregnancy at 3 months (T1) and 6 months (T2) predict postpartum depression (T3)?

- Is there an association between Body Mass Index (BMI) and perinatal EPDS scores?
- Is there a difference in perinatal scores by marital status?
- Is there a difference in perinatal depression scores between people with (private health insurance) HMO/PPO and people with (unemployment insurance) MediCAL?
- Can a patient's insurance type, BMI and T1/T2 EPDS score be used to more accurately predict PPD?

My hypotheses were as follows:

- EPDS depression screens at T1 and T2 together will predict PPD scores.
- Patients with higher BMI will have significantly higher EPDS scores.
- Patients with MediCAL or no insurance will have significantly higher EPDS scores than patients with private health insurance (HMO/PPO).
- Single patients will have significantly higher EPDS scores than married patients.
- A patient's BMI, Insurance type and T1/T2 screens together will accurately predict T3 EPDS scores.

CHAPTER III

METHODS

This study investigated the use of the Edinburgh Postnatal Depression Scale (EPDS) to detect antenatal depression. Additionally, the study sought to explore any connections in antenatal depression and postpartum depression, specifically, if antenatal depression could be used as a predictor of postpartum depression.

With respect to the previous research detailed on depression, perinatal depression, mental health screens, BMI and SES, I posed the questions of: Can screening for depression during pregnancy at 3 months (T1) and 6 months (T2) predict postpartum depression (T3)? Is there an association between Body Mass Index (BMI) and postpartum depression scores? Is there an association between postpartum depression scores and socioeconomic status? Is there a difference in perinatal EPDS scores by marital status? Can a patient's insurance type, BMI and T1/T2 EPDS scores be used together to more accurately predict PPD?

My hypotheses were as follows: Both EPDS depression screens at T1 and T2 will independently predict T3 scores. Patients with higher BMI will have significantly higher T3 scores. Patients with MediCAL or no insurance will have significantly higher T3 scores than patients with private health insurance (HMO/PPO). Single patients will endorse higher EPDS scores than married patients. A patient's BMI, Insurance type and T1/T2 EPDS screens together will accurately predict T3.

Design

This study used a longitudinal research design to examine the relationship between risk factors and EPDS scores over time. No variables were manipulated and data were collected through evidence based questionnaires and medical records. The purpose of using a non-experimental, longitudinal design was to explore the connections between variables over three distinct times - first trimester of pregnancy, third trimester of pregnancy and six weeks postpartum - rather than draw conclusive results. The study sought to examine numerous demographic and health factors with the intention of identifying those that influence PPD. This design provided the advantage of screening participants at multiple times and a disadvantage of increased drop-out rates.

Sample

777 women living in San Bernardino and Los Angeles counties participated in this study. The sample was a convenience sample of pregnant women receiving services from the Pomona Valley Hospital Family Medicine Residency Health Clinic from 2009 – 2014. Data from 366 patients were removed due to missing data such as date of birth, change of provider or lack of a completed EPDS screen. 411 patients completed one or more EPDS screens during the perinatal period (age = 15 – 42) and had all necessary demographic data. Participation was voluntary and participants were not compensated for the study, as EPDS screening was considered beneficial to the overall health of the patients. **Table 1** shows participant demographics, pregnancy history and BMI. The leftmost column organizes demographic characteristics; the middle column presents the total number of patients represented by that characteristic; the rightmost column indicates the percent of patients represented by that characteristic. Based on this data, the average participants in this study were single, Latina women of varying weight, on MediCal insurance.

Table 1. Participant Demographic Characteristics

Characteristic	Number	Percent
Race		
Hispanic	247	60.1
White	53	12.9
African-American	35	8.5
Other	23	5.6
Unknown	53	12.9
Marital status		
Single	202	49.1
Married	106	25.8
Divorced	4	1.0
Unknown	99	24.1
Insurance		
MediCal	272	66.2
HMO/PPO	54	13.1
Cash	4	1.0
Other	9	2.2
Unknown	72	17.5
BMI		
Underweight	16	3.9
Normal Weight	184	44.8
Over Weight	118	28.8
Obese	94	22.6
First Trimester Screening (T1)	309	75.2
Third Trimester Screening (T2)	211	51.3
Postpartum Screening (T3)	108	26.3
Total Participants	411	100.0

Data Collection Instruments

Two instruments were used to collect data for this study: 1. Electronic Health Records, and 2. The Edinburgh Postnatal Depression Scale.

Electronic Medical Records

Electronic Medical Records (EHR) provided general patient information, including date of birth, previous pregnancies, height and weight, pre-existing health conditions, insurance type, relationship status, and other information considered pertinent to health providers. This information was recorded at the intake appointment. EHR data were retrieved using Electronic NextGen5.

Edinburgh Depression Screen.

The Edinburgh Postnatal Depression Scale (EPDS) (Cox, Holden, & Sagovsky , 1987) has been termed the “gold standard” in measuring antepartum and postpartum depression (Dunkel-Schetter & Tanner, 2012). The EPDS is a 10-item questionnaire that asks about depressive symptoms in the past seven days and can usually be completed in five minutes. Participants are to respond to the questionnaire alone and in privacy unless they have difficulty reading or responding to the questionnaire. Patients are asked to respond to the questions by circling one of four possible responses that comes closest to how they have been feeling in the past seven days. Items on the questionnaire include: "I have looked forward with enjoyment to things," "I have been so unhappy that I have had difficulty sleeping," and "I have been anxious or worried for no good reason." Responses are scored 0, 1, 2, or 3 according to increased severity of the symptom. Items marked with an asterisk are reverse scored (i.e., 3, 2, 1, and 0). The total score is determined by adding together the scores for each of the 10 questions.

Scores range from 0 to 30 with higher scores indicating possible depression. The EPDS has removed items related to physical symptoms of depression that may be affected by the perinatal period rather than by mood. Additionally, the EPDS has included three questions to measure anxiety – not commonly found in depression screens – which have been demonstrated to be linked to postpartum depression. The reliability of the EPDS has not been established.

Georgiopoulous, Bryan, Wollan, & Yawn (2001) found that routine use of the EPDS improved diagnosis rates thus facilitating appropriate treatment. Although developed for postpartum depression, it was found to be valid for screening for antepartum depression and is available in multiple languages. It has been utilized among various populations worldwide including U.S. women and Spanish speaking women in other countries.

Common cutoff scores for depression range from 9 – 13. Scores in this area or above generally indicate risk (Cox, Holden, & Sagovsky, 1987). Studies have used various cutoffs for interpretation of the EPDS. Many prefer to use a lower cut-off to ensure that depression is not missed. The rate for failing to detect women with depression was set at 9/10 by Cox et al. (2014). In an earlier edition (Cox & Holden, 1994), the Edinburgh scoring guidelines indicated a score of 0-9 = "low risk," 10-12 = "moderate risk," 13+ = "high risk," and >/= 16 is "likely depression." For this study, I analyzed score frequencies with the following point distributions: 0-4, 5-9, 10-14, 15-19, & 20-30. (Appendix C)

Data Collection Procedures

Following approval by the Pomona Valley Hospital Medical Center (PVHMC) Institutional Review Board, all new OB patients presenting from 2009 to 2014 to the PVHMC Family Health Center (FHC), Pomona, California, were screened for depression (regardless of

signs or symptoms). Before participating in the study, participants were provided with an overview of the study and verbal consent was obtained by one of 18 family medicine residents and several faculty physicians. Formal consent from patients was not required as systematic use of the rating scale was viewed as a good standard of care.

From 2009 – 2014 longitudinal screening was done using the Edinburgh Postnatal Depression Scale (EPDS) and targeted at three distinct times: at the initial intake in the first trimester (T1), in the third trimester at or about 28 weeks (T2), and at the 6 week postpartum visit (T3). Family health clinic physicians and residents provided the participants with the EPDS questionnaire while in the exam room, explained its purpose and allowed the participant to fill out the questionnaire in privacy. At each Obstetrician intake appointment additional demographic information was collected as needed.

Data

In 2014, I began abstracting data from electronic health records and coding the data into SPSS. All identifying information was removed from the file. Demographic data were coded and patient BMI's were calculated.

EPDS

For this study, I analyzed EPDS score frequencies with the following point distributions: 0-4, 5-9, 10-14, 15-19, & 20-30. Raw scores on each of the EPDS screens were inputted directly, no coding was necessary.

BMI

I analyzed BMI score frequencies with the standardized distributions: less than 18.5 - underweight, 18.5 to 24.9 - healthy weight, 25 to 29.9 – overweight, and 30 to 35 – obese. Raw BMI scores were inputted directly, no coding was necessary.

SES

SES was determined using the patient's insurance type. It was reasoned that patients with no insurance or MediCal insurance were of lower SES than patients with private health insurance. Patients with MediCal or no insurance were coded as "1." Patients with private health insurance were coded as "2."

Marital status

Marital status was self-reported by patients on the OB intake form. Marital status was broken down into categories of (1.) Single (no partner), (2.) Married, (3.) Divorced/Separated, (4.) Other. For this study, only EPDS scores of single and married patients were analyzed due to lack of participants in the divorced and other categories.

Data Analysis

Following coding, hypotheses of difference were tested using inferential statistics. A one-way analysis of variance was used to test the hypothesis that patients of low SES would have higher risk of perinatal depression than patients with average to high SES. A one-way analysis of variance was used to test the hypothesis that overweight and obese patients would have higher risk of depression than patients with healthy weight. An independent samples t-test was used to test the hypothesis that single patients would endorse higher rates of perinatal depression than

married patients. A linear regression was used to test the hypothesis that T1 EPDS scores and T2 EPDS scores would independently predict T3 EPDS scores. A multiple linear regression was used to test the hypothesis that T2 EPDS scores, BMI scores and SES would predict T3 EPDS together. All statistical analyses were tested against an alpha level of .05. In the next chapter the results of these analyses are presented.

CHAPTER IV

FINDINGS

This study sought to use the Edinburgh Postnatal Depression Scale (EPDS) to identify depression symptoms in perinatal women at a Family Health Clinic. The objective was to collect two prenatal depression scores in roughly the first (T1) and third (T2) trimesters of each patient's pregnancy. Then, after conducting a postnatal EPDS screen during the postpartum phase of pregnancy, scores were analyzed to determine if prenatal EPDS scores accurately predict postnatal EPDS scores. Additional factors examined in relation to EPDS screens were patient Body Mass Index, patient Insurance type - a proxy for socioeconomic status, and marital status.

The following results begin with EPDS scores at each phase of the pregnancy, followed by an analysis of the drop-out rates across time periods, then analyses of the differences and/or correlations in BMI scores by Socioeconomic Status, and marital status are presented and lastly, regression analyses are described that examine the interaction between BMI, SES and T2 scores.

Results

The sections that follow will consist of an overview of means and score distributions of EPDS screens at T1, T2 and T3; followed by a report of correlations between BMI and EPDS screens, as well as correlations between SES and EPDS Screens; an independent samples t-test based on marital status and EPDS scores, followed by a report of a linear regression using T1 and T2 to predict T3, and a multiple regression using T2, BMI and SES to predict T3.

First Trimester Screen

The initial screen (T1) was completed by 309 of the 411 total participants (M = 5.77, SD = 5.31). Data from 102 participants was not available due to missed EPDS screens, or onset of health services beginning later than the first trimester of pregnancy. EPDS scores showed: 28.5% with a low risk score of 5-9, 13.9% with a moderate risk score of 10-14, 5.5% with a higher risk score of 15-19 and 2.3% with a high risk score of 20-30. Therefore, 22% of the sample screened positive for depression based on an EPDS score of 10 or above**.**

Third Trimester Screen

The second screen (T2) was completed by 211 patients (M = 5.05, SD = 4.73) (a 31% drop in participation). EPDS scores showed: 30.8% scored 5-9 (low risk), 10.9% scored 10-14 (moderate risk), 4.3% scored 15-19 (higher risk), and 0.9% scored 20-30 (high risk). At T2, 16% of the sample screened positive for depression (score >/=10).

Postpartum Screen

Of the 411 total participants, 303 did not return for a 6-8 week postnatal visit. Only 108 (26 %) patients completed the postpartum screen (T3) (M = 5.59, SD = 6.44). EPDS scores showed 18.5% scored at low risk 5-9, 9.3% scored 10-14 at moderate risk, 8.3% scored 15-19 at a higher risk, and 5.6% scored 20-30 at high risk. Combining the scores 10 or above, led to 23.2% of the sample screening positive for depression. This 23.2% of participants screening positive for depression was higher than at any other screen, indicating that patients are at highest risk for depression in the postpartum period.

Table 2 shows the EPDS scores at each screening and a breakdown of scores is presented to estimate some degree of severity.

Drop-out Rates

Large rates of patient drop-out occurred in this study. As shown in Table 2, during T1, 102 or 24.8% of patients did not complete the screen, at T2, 200 or 48.7% of patients did not complete the screen, and finally, at T3, 303 or 73.7% of patients did not complete the screen. This data is presented in **Table 2** in the "Missing" row.

Table 2. Frequency and Percentage Distribution of Edinburgh Depression Scale Scores

	T1 – Intake		**T2 – 28 weeks**		**T3- Postpartum**	
EPDS Score	N	Percent	N	Percent	N	Percent
0 - 4	154	49.8	112	53.1	63	58.3
5-9 (low risk)	88	28.5	65	30.8	20	18.3
10-14 (moderate risk)	43	13.9	23	10.9	10	9.3
15-19 (higher risk)	17	5.5	9	4.3	9	8.3
20-30 (high risk)	7	2.3	2	0.9	6	5.6
Missing	102	24.8	200	48.7	303	73.7
Total	309	100.0	211	100	108	100.0

Using T1 & T2 to Predict T3

It was hypothesized that perinatal depression scores (T1 & T2) would individually predict postpartum depression scores (T3). Linear regression was used to test the hypothesis. Linear regression analysis showed that T2 scores significantly predicted T3 scores, (β = .450, t = 2.325, p = .025). T1 scores did not predict T3 scores (β = -.049, t = -.252, p = .802). The results of the regression analysis are depicted in **Table 3**.

Table 3. Linear Regression Analysis of EPDS Scores

	β	t-value	Sig.
Independent Variables			
1. First Trimester Screen	-.049	-.252	.802
2. Third Trimester Screen	.450	2.325	.025

Body Mass Index

Patient population BMI statuses were taken at the beginning of each patient's pregnancy. BMI distributions are as follows: 44.8% of patients were of normal weight, 28.8% were categorized as overweight while 22.6% were obese. It was hypothesized that BMI scores would positively correlate with EPDS scores at each screening period. **Table 4** shows a significant positive correlation between BMI scores and postnatal screen scores, (Pearson $r = .231$, $p = .023$, n = 96). Although a relatively low correlation, the results show that as patient weight increased so did symptoms of postpartum depression, EPDS scores. In **Table 4**, the numbers in the top row correspond with the variable numbered in the leftmost column

Table 4. Bivariate Correlation between Edinburgh Scores and BMI

Variables	1	2	3	4
1. BMI	-			
2. Edinburgh 1	-.035	-		
3. Edinburgh 2	.058	.606	-	
4. Edinburgh 3	.231*	.245	.514	-

* $p < .05$

Socioeconomic Status

It was hypothesized that patients with lower SES (MediCal) (n = 272) would endorse higher rates of depressive symptoms than patients of higher SES (HMO/PPO) (n = 54). Participants with private insurance (HMO/PPO) were grouped and EPDS scores were compared to participants with Medicaid (MediCAL). A one-way analysis of variance (ANOVA) was used to test for differences in EPDS scores based on insurance type (private vs. MediCal) at each screen (T1, T2 & T3). **Table 5** shows results of the ANOVA comparison between SES and EPDS scores. Results indicated that the difference in EPDS scores and insurance (a proxy for socioeconomic status) trended towards significance only ($F(1, 252) = 3.52$, $p = .06$) on T1 EPDS scores because private insurance EPDS scores ($M = 4.42$) were lower than Medicaid EPDS scores ($M = 5.99$). A statistically significant difference ($F(1, 176) = .034$, $p > .85$) between EPDS scores at T2 was not found because private insurance EPDS scores ($M = 5.32$) were not significantly lower than Medicaid EPDS scores ($M = 5.12$). Further, there was no significant difference between EPDS scores at T3 because private insurance EPDS scores ($M = 4.00$) were

not significantly lower than MediCal EPDS scores ($M = 6.21$), $F(1, 92) = .784$, $p > .378$. The lack of significance in T3 scores was due to insufficient participants in the HMO/PPO group.

Table 5. Comparison of EPDS Scores by Socioeconomic Status

Group	N	M	F-value	df	Sig.
First Trimester Screen			3.52	1, 252	.062
PPO/HMO	48	4.42			
MediCal	205	6.0			
Third Trimester Screen			.034	1, 176	.853
PPO/HMO	22	5.32			
MediCal	155	5.11			
Postnatal Screen			.784	1, 92	.378
PPO/HMO	8	4.0			
MediCal	85	6.21			

Comparison of EPDS Scores by Marital status

It was hypothesized that single or unmarried patients would endorse higher EPDS scores than married patients. Single participants were grouped and EPDS scores were compared to married participants. An independent samples t-test was used to test for difference in EPDS scores based on marital status at each screen (T1, T2 and T3). **Table 6** shows results of the t-test by marital status and EPDS scores. Results indicated that the difference in EPDS scores and marital status was significant only on T1 EPDS score because married patient EPDS scores ($M = 4.77$) were lower than single patient EPDS scores ($M = 5.86$), ($t(180) = 1.57$, $p = .05$). A

statistically significant difference between EPDS scores at T2 was not found because married patient EPDS scores (M = 5.12) were not significantly higher than single patient EPDS scores (M = 4.55), (t(99) = -0.71, p = .23). Further, there was no significant difference between EPDS scores at T3 because married patient EPDS scores (M = 5.72) were not significantly higher than single patient EPDS scores (M = 5.44), t(47) = -0.18, p = .43).

Table 6. Independent Samples t-test by Marital Status

Group	N	M	t-value	df	Sig.
First Trimester Screen			1.57	180	.05
Single	162	5.86			
Married	89	4.77			
Third Trimester Screen			-0.71	99	.23
Single	107	4.55			
Married	59	5.12			
Postnatal Screen			-0.18	47	.43
Single	58	5.44			
Married	26	5.72			

Major Findings

It was hypothesized that as BMI increased, T2 scores increased and SES decreased, the likelihood for postpartum depression would increase. A multiple regression was conducted to determine if Insurance type (MediCal/Cash versus PPO/HMO), BMI and third trimester (T2) screen scores predicted postpartum (T3) screen scores. A statistically significant regression

equation was found (F= 7.826, p=.000, R square=.25). The analysis shows that Insurance type and BMI did not independently significantly predict postpartum screen scores. However third trimester screen scores did significantly predict postpartum screen scores (Beta = .739, t(60) = 4.359, p=.000).

Table 7. Regression Analysis using BMI, SES and T2 as predictors of T3

	β	**t-value**	**Sig.**
Independent Variables			
1. Insurance Type	-2.374	1.142	.259
2. BMI	.163	1.286	.203
3. Third Trimester Screen	.739	4.359	.000

The next chapter summarizes these findings relating back to prior research and draws implications for practice and future research. Limitations of the study are also described.

CHAPTER V

Discussion

The present study addressed the following questions:

- Can screening for depression during pregnancy at 3 months (T1) and 6 months (T2) predict postpartum depression (T3)?
- Is there an association between Body Mass Index (BMI) and perinatal depression scores?
- Is there a difference in perinatal depression scores between people with (private health insurance) HMO/PPO and people with (unemployment insurance) MediCAL?
- Is there a difference in EPDS scores by marital status?
- Can a patient's SES, BMI and T1/T2 score be used to more accurately predict PPD?

The following chapter will discuss the findings presented in the previous chapter as well as theorize possible explanations for the statistical outcomes. Further, this chapter will discuss the study's limitations, implications for social work practice, and identify suggestions for future research.

EPDS Scores

The EPDS scores obtained in this sample lie within the range suggested by other studies (Gaynes, et al., 2005; Le Strat et al., 2011; Vega-Lopez, Banco, Keyes, Olfson, Grant & Haisin, 2008) Research conducted by Gaynes, et al., (2005) suggests that roughly 18.4% of women are depressed during their pregnancy. The sample in the present study screened positive for

depression at a rate of 22% during T1 and 16% during T2. These two rates averaged together yield a combined rate of 19.4%, which is slightly above the recommended national average. This 1.0% - increase in depression rates may be due to the high rates of low SES patients in this sample. Of the 411 patients screened for depression, 276 patients (67%) had MediCal insurance or no insurance at all. These high rates of low socioeconomic status likely contribute to the marginally high rates of perinatal depression in this study (Goyal et al., 2011).

There were no clinically significant differences between EPDS scores in the three time periods despite postnatal screen scores trending higher than antenatal scores. Although a small sample (n =108), the highest endorsement of depressive symptoms occurred at the postnatal visit, followed by intake scores (T1) and then by the third trimester screen (T2). This finding adds to the existing literature by indicating that depression rates may rise after delivery.

Closer analysis of these results indicates the possibility that screening positive for depression at T1 would allow for earlier identification and more focused follow-up by the provider, thus decreasing depression overall at T2. Further, screening positive for depression at T2 may also lead to closer follow-up, but within a shorter period of time. Thus, depressive symptoms from the third trimester of pregnancy are less adequately addressed, increasing the likelihood of developing PPD. Therefore, while screening for depression at T2 more accurately predicts PPD, screening for depression in the first trimester of pregnancy may lead to an overall decrease perinatal depression in general. Despite this study not measuring clinical interventions on positive depression screens, it is argued by Gaynes et al., (2005) that systematic practices aimed at pregnant women with depression decreases depression better than no interventions at all. Thus, screening for depression in T1, though not a strong predictor of PPD, allows for the medical team to approach the pregnancy in a more focused manner that may lead to a decrease in

patient depressive symptoms (e.g., additional follow-up appointments, behavioral health referrals etc.).

Using T1 & T2 to Predict T3

The primary goal of this study was to identify an appropriate time during pregnancy to screen for depression, which might accurately predict postpartum depression. To my knowledge, few previous studies screen for antenatal depression at multiple time frames during the pregnancy. Though the American Academy of Pediatrics (AAP) recommends screening for depression at each well-child visit (AAP, 2010), they provide no recommendations for when screenings might be most critical. Common systemic practice today suggests that screening for depression at six weeks postpartum is the most common screening for perinatal depression (Apgar et al., 2005).

An added advantage of EPDS screening is that patients who screen for depression are likely to receive more focused care. Gaynes et al., (2005) analyzed results from eleven studies screening for depression in a medical setting and found that positive screens often resulted in increased psychosocial support for the patient through increased follow-up and referrals. Although screening for depression at T1 does not independently reduce depression rates, it is plausible that patients with a positive screen would have endorsed greater depressive symptoms over time without early screening and the focused care mentioned in Gaynes et al., (2005) – which included more frequent visits and behavioral health referrals.

The results of this study indicate that screening for depression during the first trimester of pregnancy (T1) was not an accurate predictor of postpartum depression. However, results did indicate that screening in the third trimester (T2) predicted postpartum EPDS scores. While the

predictable value of T2 screens may be due to temporal proximity, they suggest that the third trimester is a necessary time to screen considering the results also found that many women do not return for the postnatal visit and may therefore be lost to follow-up. The antenatal screens allow for providers to place emphasis on a patient's return for postpartum follow-up – an opportunity that may have otherwise been missed.

Body Mass Index

The patient population consisted of roughly 50% overweight and obese women – reflective of the national average reported by Reece et al., (2008). LaCoursiere, et al., (2010) found that the rate of postpartum depression was directly related to the extremes of BMI. In their study, rates of postpartum depression in the underweight, normal weight, and pre obese groups were 18%, 14%, and 19%, respectively. Those in the obese class I, class II, and class III groups were 19%, 32%, and 40%, respectively (LaCoursiere et al., 2010). Although I did not conduct such analysis for this sample, the results were consistent with that of LaCoursiere, et al., (2010) in that EPDS scores resulted in a significant positive correlation with BMI scores.

This positive correlation between pre-pregnancy BMI and postpartum EPDS scores, and not with the scores from the first or second screening may be due to the expectation of weight gain, and altered body and body image during pregnancy. Therefore, even in women with high BMI's who become pregnant, being heavier is more socially (if not medically) expected/acceptable. Perceptions of weight may not be as critical and affect mood during pregnancy. However, when women with high BMI's give birth and are no longer pregnant but again considered overweight, their perceptions and those of others may change contributing to depressed mood symptoms (Clark et al., 2010; LaCoursiere, Baksh, Bloebaum & Varner, 2006). Other studies have found that obese women report experiencing an increase in emotional and

traumatic stress during pregnancy (LaCoursiere et al., 2006). Such an increase would likely lead to an increase in postpartum depressive symptoms.

The results of this study are consistent with the Salehi-Pourmehr et al., (2017) study, where obese patients were found to be 3-4 times more likely to screen positive for depression than normal weight patients at each time frame during the pregnancy. Similar to this study, Salehi-Pourmehr et al., (2017) found a significant increase in depression during the postpartum period – patients were seven times more likely to screen positive for depression, highest than at any other time frame.

Regardless of the directionality and mechanism of the obesity-depression association, these findings highlight the need for additional surveillance in overweight and obese women. In this particular clinic, women with a BMI >35 alone with no other risk factors are automatically referred to obstetricians and are lost to primary care follow-up and opportunities to monitor mood and functioning. Some obstetricians in the community deem women with BMI > 40 as too high risk for their practices thus limiting women's choices and perhaps affecting care.

Socioeconomic Status

Results indicated that insurance type resulted in no significant differences at each EPDS screen. However, the differences in EPDS by insurance type were marginally significant in the first trimester of pregnancy. This marginal difference in EPDS scores indicated that patients with MediCal or no insurance endorsed higher rates of depressive symptoms than patients with private insurance. These results are consistent with that of Goyal et al., (2011), who found low SES to be associated with numerous individual risk factors of depression that led to increased likelihood of depression – two of these risk factors being high BMI and being unmarried.

The fact that this marginal significance occurred at the onset of pregnancy, and not at the third trimester of pregnancy or at the postpartum phase, may be due to anticipatory anxiety around pregnancy and financial resources. Patients with the financial means to access private insurance (higher SES) experience fewer risk factors that may lead to increased maternal mental health issues (Goyal et al., 2011). This finding is also consistent with results reported by Lorant et al., (2003) who found that women of low SES were 2.6 times more likely to experience psychiatric symptoms than women of high SES. Though Lorant et al., (2003) notes this increase in likelihood may be due to issues of over diagnosis and cultural factors, the EPDS screen has been shown to be reliable across languages and geography (Department of Health, Government of Western Australia, 2006). Research by Molynueax, et al., (2016) also found that antenatal depression was twice as high in low SES women than high SES women due to risk factors associated with financial deprivation. An added explanation may be due to women of low SES being more likely to become pregnant while single (Goyal et al., 2010).

Marital Status

The finding that single patients were more likely to experience depressive symptoms in the first trimester when compared to married patients is somewhat consistent with prior literature. Research has demonstrated that emotional support of a partner can both decrease the risk of PPD and predict the likelihood of developing PPD (Beck, 2001; DeKlyen, Brooks-Gunn, McLanahan & Knab, 2006; Segre, O'Hara M, Arndt, & Stuart, 2007). In the present study, I found that marital status resulted in a significant difference in depression levels only during the first trimester of pregnancy. This may be due to the majority of the sample being single women – thus, skewing the data. No other studies to my knowledge examined marital status and its effect at numerous different points during and after the pregnancy.

Similarly to the results of the BMI and SES analyses, marital status only resulted in a significant difference in depression rates during the first trimester. This may also be due to anticipatory anxiety about father of baby support and involvement in the pregnancy. The decrease in depression rates over time may also be explained by the participant growing accustomed to their relationship status, or through the identification of other sources of support.

Considering the population of this study was 70% Latina, it is also likely that cultural considerations better explain the reduction in depression as the pregnancy goes on. Specifically, high levels of familial involvement and support associated with Latino families may assuage the effects of marital status as the pregnancy proceeds. Nadeem (2005) reports that Latino communities place great emphasis on family and are therefore likely to live with family, particularly while experiencing an adolescent pregnancy. Further, Nadeem (2005) found that pregnant Spanish speaking and bilingual adolescent Latina women experienced less depressive symptoms and increased self-esteem when living with their mothers. Additionally, Hayden, Connelly, Baker-Ericzen, Hazen & Howitz, (2013) found that Latino mothers often report that their experiences with depression are often linked to social support from family. Thus, indicating that results from this population should be more closely situated amongst cultural components unique to the Latino community.

Although Akincigil et al., (2010) found that FOB support significantly predicted postpartum depression while controlling for social support; their research did not focus on a specific ethnic group. Research presented by Nadeem (2005) and Hayden et al., (2013) indicates that Latina mothers may experience considerably more social support than the norm in the U.S. This additional social support may account for the relative decrease in perinatal depression over time in single mothers in this study.

On the other hand, married patients endorsed the lowest levels of depression during the first trimester than at any other time during the pregnancy. This decrease in depression rates may be accounted for by what Akincigil et al., (2010) characterized as – partner agreement in choosing to have a child. Married couples are more likely to have chosen to have a child than unmarried couples, and are therefore more likely to be prepared for the pregnancy, resulting in decreased anxiety and psychiatric symptoms. Further, considering the argument made by Nadeem (2005) that Latino's emphasize familial involvement, married patients would experience increased familial support and thus, decreased depression.

Drop-out Rates

One significant finding of this study, though not intended, was the drop-out rates of participants at each screening. As mentioned, at T1 24.8% of patients did not complete the screen, at T2 48.7% of patients did not complete the screen, and at T3 73.7% of patients did not complete the screen. At each consecutive screen, 25% more patients did not complete the EPDS screen, respectively. A similar trend was also found in Salehi-Pourmehr et al., (2017) - patients gradually dropped out at each consecutive screening. It would seem that this result is to be expected, but not to the extent that was observed in the present study. While this result points to limitations in the study's procedure, it may also be explained by providers' failing to administer screens, failure to input screens into the patient's charts, or another likely explanation that patients simply did not return for follow-up appointments.

In regards to the interpretation that providers failed to administer and input EPDS screens, this may point to a lack of prioritization of patients' mental health in the clinic. Providers were specifically trained to administer these screens, yet the drop-out rate approached 75% by the end of the study.

In regards to the interpretation that patients failed to return for follow-up appointments, this points to a need for more patient education on the importance of follow-up visits, particularly during the postpartum period. Further, underlying patient failure to return for postnatal follow-ups, is the likely explanation that patients were unaware that postnatal visits were necessary or that their insurance would continue to cover postnatal visits. Another possible theory is that patients experiencing depressive symptoms, namely, lack of motivation and fatigue, may be less likely to follow-up with appointments and not return for screenings.

Ultimately, the explanation for patient drop-out rates is likely a combination of these interpretations. Regardless of the reason, this data points to the need for designated personnel in the clinic to be responsible for issues of mental health screening, education around follow-up appointments and insurance coverage.

Major Findings

An additional focus of the study was to explore the use of BMI, SES and T2 scores to predict postpartum depression. A significant regression model was found using the three variables to predict PPD, indicating that women presenting with low SES, high BMI and positive depression scores at T2 are at highest risk for postpartum depression. These results confirmed the hypothesis of the study and are supported by previous research.

The finding that pre-pregnancy BMI positively correlated with PPD is directly supported by Salehi-Pourmehr et al., (2017) and is supported by various other studies linking BMI to depression (Clark et al., 2009; LaCoursiere et al., 2010; Molyneaux et al., 2016). The finding that SES marginally correlated with depression during T1 is also supported by previous research (Goyal et al., 2011; Lorant et al., 2003; Molyneaux et al., 2016). The finding that T2 scores

significantly and independently predicted PPD adds to the current literature by identifying a specific time when screening may be most effective at identifying risk for PPD. The finding that T1 scores were not individually predictive of PPD but that EPDS scores decreased at T2 suggests that there may be use in screening at T1, despite inaccuracy in predicting PPD. Specifically, it is possible that positive T1 screens led to more focused patient care and follow-up which may have led to a decrease in T2 scores. These findings as a whole provide insight into which patients are at greatest risk due to psychosocial vulnerabilities and disadvantages. These risk factors can be used as early identifiers for risk and in training providers to address these issues in family health clinics.

Implications for Clinical Practice

In the present study, physicians and residents were tasked with the duties of administering EPDS screens. Moving forward, I argue that, while physicians and residents should be informed and actively practicing EPDS screenings, an integration of social workers into obstetric teams would most effectively ensure perinatal depression is addressed. Considering issues of depression, SES and marital status comprise aspects of the biopsychosocial model; staff with specific training and emphasis on these areas should be responsible for their tracking, support and intervention. According to the biopsychosocial model, these factors are almost always both interrelated and independent (Engel, 1977); requiring appropriate interventions from professionals trained in addressing these environmental factors. Underlying factors of SES, BMI and social support are social determinants of health. If risk factors such as these go unaddressed, the patient is likely exposed to higher cortisol levels and thus, a greater risk of mental health issues (Garland & Howard, 2009). Through social work intervention, these risk factors can be

addressed, and appropriate interventions can be identified, ultimately, attempting to address the negative effects of social determinants of health.

Considering the marginalization of patients of low SES, the health risks of patients with high BMI and the limited spousal support of single mothers, I argue that social workers should pay close attention to patients presenting with signs of depression as well as a combination of these risk factors. Using the readily identifiable data points of BMI, SES, Marital status and T2 screens, I suggest that social workers take on the responsibility of educating providers of the risk each patient presents in developing PPD.

Although depression screening should be universal during pregnancy, I contend there is added benefit in identifying women at greater risk for PPD, regardless of EPDS scores, because it presents for greater opportunity for earlier detection and intervention – which has a considerable impact on the health of the mother and her fetus (Salehi-Pourmehr et al., 2017). The profession most appropriate in addressing these risk factors and educating the patient and healthcare team of their impact on maternal mental health is social work.

With changes in the medical model as a result of The Affordable Care Act (ACA), social workers now have greater opportunity for visibility, leadership and reform (Lynch, Greeno, Teich & Delany, 2016). Specifically, with the ACA's increased access to behavioral healthcare services and increased emphasis on collaborative care, social work integration into low-income community family health clinics would serve to meet these increased needs. More specifically, in section 1302 of the ACA's "essential benefits," are outlined to include "preventive services including counseling, screenings" as well as "care before and after a baby is born" (Lynch et al., 2016, p. 2).

Social work has a dedication and mission to serve patients living in poverty and facing numerous stressors and disadvantages. Social work also has a history of working within and across systems, allowing them to navigate collaborative health care more effectively than many other health care professions (Lynch et al., 2016). Further, social workers are the most appropriate professionals to address issues of unplanned pregnancies, obesity, limited socioeconomic resources and depression. These issues are the very "disadvantages" social work was developed to address, allowing other healthcare providers to focus on their roles – managing the mother's health, the child's health and ensuring the family undertakes a healthy pregnancy.

I argue that moving forward, family health clinics should begin to integrate and utilize the profession of social work with specific guidelines to address patient health disadvantages of SES, mental health, BMI and marital status. Using existing medical records and the EPDS screens, social workers can quickly identify risk for postpartum depression and intervene; both educating the patient and providers of these risks and their respective interventions.

Limitations

Drop-out rates. Of the three risk factors measured, BMI, SES and Marital status, SES and Marital status had their highest significance at T1. This finding may suggest that T1 is a time when certain mothers (low SES and/or single) are at heightened vulnerability. However it also presents the possibility that the results were more significant due to greater numbers of participants in the T1 phase. Only 51% of the women were screened during the third trimester (T2) and 26% of women were screened during the postnatal visit, demonstrating difficulty with consistency in the study's procedure. Since various providers collected data (residents and faculty) a more effective system should be devised to make screening systematic and universal. Better methods are also needed to ensure that many more women return for their postnatal visit.

The lower number may also be attributable to some OB patients being referred to obstetricians when medical complications such as gestational diabetes surface.

Ethnicity. Additionally, the large majority (70%) of the participants were Latina and had MediCal insurance. A separate analysis on this patient population would be beneficial. Due to limited participants of other ethnic groups, my ability to conduct data analyses in regards to race was limited. Hayden, et al., (2013), in their qualitative study of perceptions and experiences of maternal depression in Latinas, concluded that considerable research is needed to better understand how best to further assess and intervene successfully with the Latino population. Liu & Tronick (2013) found that when comparing pregnant women across ethnicities, African-American and Hispanic women were significantly more likely to experience postpartum depression than Asian and White women. However, they also found that Asian and White women were significantly more likely to receive a diagnosis of PPD than Black or Hispanic women. Thus, these results indicate that socio-demographic variables influence the likelihood of detecting a diagnosis more so than patient symptomatology. Consequently, though my study did not analyze results across ethnicity, it is likely that these socio-demographic variables may have also led to a decrease in detection in this majority Latina sample.

Negative Screens

The fact that 28.5 %, 30.8% and 18.3% of the women at each screening respectively, endorsed symptoms classified as "mild," deserves closer attention. Since perinatal depression is formally defined as minor or major symptoms of depression, these women could technically be considered to have some degree of distress despite necessary caution in overinterpreting the EPDS and the need for a higher threshold for a positive screen. Further, pregnancy alone is a

necessary cause for distress, often related to hormonal imbalances and therefore not an indicator of need for intervention.

Future Research

A training goal was to train family medicine residents and physicians to develop a habit of screening women for depression throughout pregnancy and at the postpartum visit. A survey following residency training to see if this pattern continues as well as its perceived value could determine the impact of training efforts in this area. A recent study found that re-screening women for depression at 6 and 12 months postpartum with the Patient Health Questionnaire (PHQ-9) identified elevated depression scores among women who had scored within normal limits when screened at 4-12 weeks postpartum (Yawn, Bertram, Kurland & Wollan , 2015). This suggests that screening is optimal at discrete periods for the first year after delivery. However, as Geier, et al. (2014) point out, women generally have their last visit at six weeks and many may not be seen by their own health care provider for some time. Future research might address this issue by making screens more accessible over time.

Considering this was a pilot study with the goal of identifying risk factors during pregnancy as well as appropriate time frames to screen during pregnancy, I suggest that this study be replicated with more accuracy, consistency and control. The methods used in this study were a retroactive review of data collected in everyday practice at the family health clinic. With more distinct guidelines and control, the drop-out rates would be largely reduced, leading to more conclusive results.

Additional attention to BMI is critical, with rising rates of obesity in America. This study reviewed perinatal depression in relationship to pre-pregnancy BMI. A more focused study

might examine BMI throughout the pregnancy and postpartum period to more closely examine the relationship between weight gain/change during pregnancy and depression.

Due to the skewedness of the sample, I was unable to draw conclusive results for lack of participants in a given demographic characteristic. Race in particular was one such example of lacking data on White and Black participants. If this research is replicated in a similar area with a similar racial distribution, oversampling of these racial groups is encouraged in order to permit data analysis by race.

Lastly, if this study were replicated, mediation analyses would be beneficial in drawing conclusions for why these results occurred. For example, participants could be surveyed explicitly in regards to the effect of marital status on their mental health and/or stress levels. Researchers should collect data on the mediating effects of marital status, BMI and SES on depressive symptoms. It is not enough to know that BMI increases the likelihood of PPD. Rather, research should identify "what specifically" about obesity increases depression. These specifics might lead to more appropriate and effective clinical interventions.

Conclusion

Rates of income inequality in America are rising (Weaver & Rivello, 2006), as are rates of obesity (LaCoursiere et al., 2006). Understanding these factors and their impacts on pregnant women is critical to comprehensive patient care. The findings of this study underscore the issues of social determinants of health and the need for increased medical interventions stemming from the biopsychosocial model of care. Patients with the social and financial capital allowing access to the resources necessary for a healthy pregnancy and birth should not be the standard mold for hospitals, particularly those in low-income areas. Hospitals and clinics should shift practices to

better include comprehensive services and interventions aimed at patients lacking in economic and social privilege. This shift should start with increased attention to maternal mental health during pregnancy, and the risk factors that influence maternal mental health. At the forefront of this reform, should be social workers changing the culture of hospitals and clinics to better address marginalized patients' needs.

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Appendix A

POMONA VALLEY HOSPITAL
MEDICAL CENTER
Expert care with a personal touch

October 31, 2016

Jackson Doyle
Anna Pavlov, PhD.
Pomona Valley Hospital Family Medicine Residency Program

Protocol Study:	Cultural Implications and Risk Factors of Efforts to Universally Screen Obstetric Patients for Depression in a Family Health Clinic
Approval Type:	Initial Submission
Expiration Date:	10/30/2017
Next Report Due:	In 10 months

Dear Mr. Doyle:

This is to advise you that your request for initial review of the above noted protocol was expedited by the Institutional Review Board on October 31, 2016. The information submitted is listed:

Date Received- 10/27/2016 Remarks: Expedited study - PI only doing further data analysis on existing data from previous study: 'Perinatal Depression and the Impact of Screening on the Rates of Post-Partum Depression'. Informed Consent has been waived since only data analysis will be done.

Conditions of IRB approval: When reporting or publishing the data, the PI must provide aggregate data only with no patient identifiers and no individual data reported.

You will need to immediately communicate to the IRB Office if there are any unexpected ill effects on the patient(s) as a result of this study. Approval of this protocol expires on January 23, 2018, however, **your next annual renewal report is due 10 months from the approval** and the Principal Investigator, Co-Investigator, or Clinical Trials Coordinator must present the annual report to the committee in person. Please submit reports on the number of patients participating in the study, results of the study, and the annual report.

Any information regarding this study can be submitted to IRB Office, at the Cancer Care Center at Pomona Valley Hospital Medical Center, 1910 Royalty Drive, Pomona, CA 91767-9927. Annual reports are due four (4) weeks prior to the meeting and any submissions that are presented after the deadline will be held until the next meeting. If you have any questions, please feel free to contact me at (909) 865-9692.

Sincerely,

Sri Gorty, M.D.
Chairman
PVHMC Institutional Review Board

Appendix B

School for Social Work

Smith College

Northampton, Massachusetts 01063

November 2, 2016

Jackson Doyle

Dear Jackson,

The Smith College School for Social Work Human Subjects Review Committee approves your request for exemption from SSW Human Subjects Review based on the fact that the Pomona Valley Hospital Medical Center is the IRB of record and your study involves the use of secondary data. We wish you the best with your research.

Sincerely,

Elaine Kersten, Ed.D.
Co-Chair, Human Subjects Review Committee

CC: Joyce Everett, Research Advisor

Appendix C

Name:
Date:
Address:
Baby's Age:

As you have recently had a baby, we would like to know how you are feeling. Please UNDERLINE the answer which comes closest to how you have felt IN THE PAST 7 DAYS, not just how you feel today.

Here is an example, already completed.

I have felt happy:
- Yes, all the time
- <u>Yes, most of the time</u>
- No, not very often
- No, not at all

This would mean: "I have felt happy most of the time" during the past week. Please complete the other questions in the same way.

In the past 7 days:

1. I have been able to laugh and see the funny side of things
   - As much as I always could
   - Not quite so much now
   - Definitely not so much now
   - Not at all

2. I have looked forward with enjoyment to things
   - As much as I ever did
   - Rather less than I used to
   - Definitely less than I used to
   - Hardly at all

*3 .I have blamed myself unnecessarily when things went wrong
   - Yes, most of the time
   - Yes, some of the time
   - Not very often
   - No, never

4. I have been anxious or worried for no good reason
   - No, not at all
   - Hardly ever
   - Yes, sometimes
   - Yes, very often

*5. I have felt scared or panicky for no very good reason
   - Yes, quite a lot
   - Yes, sometimes
   - No, not much
   - No, not at all

*6. Things have been getting on top of me
   - Yes, most of the time I haven't been able to cope at all
   - Yes, sometimes I haven't been coping as well as usual
   - No, most of the time I have coped quite well
   - No, have been coping as well as ever

*7. I have been so unhappy that I have had difficulty sleeping
   - Yes, most of the time
   - Yes, sometimes
   - Not very often
   - No, not at all

*8. I have felt sad or miserable
   - Yes, most of the time
   - Yes, quite often
   - Not very often
   - No, not at all

*9 I have been so unhappy that I have been crying
   - Yes, most of the time
   - Yes, quite often
   - Only occasionally
   - No, never

*10. The thought of harming myself has occurred to me
   - Yes, quite often
   - Sometimes
   - Hardly ever
   - Never

EDINBURGH POSTNATAL DEPRESSION SCALE (EPDS)
J. L. Cox, J.M. Holden, R. Sagovsky
From: *British Journal of Psychiatry* (1987), 150, 782-786.

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